considerably. Thus, the object is usually drawn and the underlying deletions are preferably performed upon acceptance of object at a desired location.

An example of objects including clip patterns to partially delete any underlying graphic object elements is TEXT, where it is desired to create "white space" for TEXT annotation. The objects to be deleted are contained in a specification for that type of annotation. In FIG. 5, for example, if the TEXT overlaps certain underlying objects, a portion of the object coincident with the TEXT is deleted. Also, if the definition of the floating object includes a closed shape drawn with specific graphic parameters, the geometry object engine causes the CAD system to partially delete all specified graphic objects that fall within the defined region. This has the effect of "cleaning up" graphic elements that would otherwise appear to be visually merged with the floating object.

It is now appreciated that a presumptive mode CAD system according to the present invention interactively manipulates and displays selected objects according to predefined geometric relationships for acceptance by an operator. The system automatically exhibits the correct graphic and geometric relationships in an interactive fashion. Thus, the present invention allows an operator to more rapidly produce accurate digital computer drawings that conform to predefined specifications for appearance, content and relationships among the graphic objects that convey cognition for the intent of designs. The computer operator is relieved of the duty of learning the correct layout of graphic objects to assemble a valid representation of a design, system or model. In effect, a system according to the present invention is an "expert" CAD system, so that the operator need not be very knowledgeable to produce correct graphic results and representations.

Although the system and method of the present invention has been described in connection with the preferred embodiment, it is not intended to be limited to the specific form set forth herein, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents, as can be reasonably included within the spirit and scope of the invention as defined by the appended claims.

I claim:

~~1. A method of operating a computer aided design system~~ in presumptive mode, comprising the steps of:

moving a selected graphic object relative to a graphic pointing symbol;

determining when the selected graphic object is within a predetermined proximity of an underlying graphic object;

manipulating the selected graphic object into a geometric relationship with the underlying graphic object according to predetermined geometric rules; and

dynamically updating the geometric relationship based on movement of the graphic pointing symbol while the graphic pointing symbol remains within the predetermined proximity of the underlying graphic object.

2. The method of claim 1, wherein the predetermined proximity is a location tolerance before said manipulating step and converts to a larger rejection tolerance during said maintaining step.

3. The method of claim 1, wherein said manipulating step comprises the step of:

orientating the selected graphic object according to a tangential angle with respect to the underlying graphic object at a cling point.

4. The method of claim 1, wherein said manipulating step ~~includes the step of:~~

positioning the selected graphic object at a predetermined offset relative to the underlying graphic object.

5. The method of claim 4, wherein the underlying graphic object has two sides, during said maintaining step, further comprising the step of:

moving the selected graphic object to the opposite side of the underlying graphic object when the graphic pointing symbol is moved to the opposite side.

6. The method of claim 5, wherein said maintaining step further comprises the step of:

mirroring the selected graphic object about the underlying graphic object when moved to the opposite side of the underlying graphic object.

7. The method of claim 6, wherein said maintaining step further comprises the step of:

mirroring the selected graphic object about a perpendicular offset line when moved to the opposite side of the underlying graphic object.

8. The method of claim 5, wherein said maintaining step further comprises the step of:

mirroring the selected graphic object about a perpendicular offset line when moved to the opposite side of the underlying graphic object.

9. The method of claim 1, after said manipulating step, further comprising the step of:

modifying the underlying graphic object according to the predetermined geometric rules.

10. The method of claim 9, wherein said modifying step comprises the step of:

dividing the underlying graphic object into two separate underlying graphic objects for inserting the selected graphic object therebetween.

11. The method of claim 10, wherein said modifying step further comprises the step of:

deleting a portion of the original underlying graphic object for inserting the selected graphic object.

12. The method of claim 1, wherein the selected graphic object includes at least one alignment vector, said manipulating step further comprising the step of:

aligning the selected graphic object with the underlying graphic object according to the alignment vector.

13. The method of claim 1, wherein the selected graphic object and the underlying graphic object each have an alignment vector, wherein said manipulating step comprises the step of:

aligning the selected graphic object with the underlying graphic object by aligning the alignment vectors.

14. The method of claim 1, wherein the selected graphic object includes a clip region, said manipulating step further comprising the step of:

partially deleting the underlying graphic object according to the clip region.

15. The method of claim 14, wherein the underlying graphic object comprises a plurality of graphic objects, said partially deleting step further comprising the step of:

partially deleting only selected ones of the plurality of graphic objects corresponding to the clip region.

16. The method of claim 1, wherein said maintaining step further comprises the steps of:

clinging the selected graphic object to an initial cling point; and

rotating the selected graphic object about the initial cling point corresponding to movement of the graphic pointing symbol.

17. The method of claim 1, further comprising the step of

~~unclinging the selected graphic object from the underly-~~ ing graphic object to move with the graphic pointing symbol when the graphic pointing symbol is moved a greater distance than the predetermined proximity from the underlying graphic object.

18. The method of claim 1, wherein said maintaining step includes the step of:

moving the selected graphic object relative to a sliding cling point along the underlying graphic object where the cling point moves relative to the graphic pointing symbol as the graphic pointing symbol is moved within the predetermined proximity of the underlying graphic object.

19. The method of claim 18, wherein said maintaining step further comprises the step of:

interactively modifying the underlying graphic object according to the predetermined rules and relative to the sliding cling point as the graphic pointing symbol is moved.

20. The method of claim 18, wherein the underlying graphic object includes a primary vector and a secondary vector, the selected graphic object having a first alignment vector and a second alignment vector, wherein said manipulating and maintaining steps further comprise the steps of:

aligning the selected graphic object with the primary vector according to the first alignment vector when the first alignment vector is within a predetermined proximity of the primary vector; and

aligning the selected graphic object with the secondary vector according to the second alignment vector when the second alignment vector is within a predetermined proximity of the secondary vector.

21. A method of operating a computer aided design system, comprising the steps of:

providing at least one graphic object to be selected for insertion into a graphic design;

displaying and moving a selected graphic object with a graphic cursor moved within the graphic design;

when the selected graphic object is within a predetermined proximity with respect to one or more underlying graphic objects, automatically manipulating the object into a geometric relationship with the underlying graphic object; and

dynamically updating the geometric relationship based on movement of the graphic cursor while the graphic cursor remains within the predetermined proximity of ~~the underlying graphic object.~~

~~22. The method of claim 21, wherein said manipulating~~ step comprises the steps of:

orienting the selected graphic object relative to a cling point along the underlying graphic object; and

positioning the selected graphic object at a predetermined offset relative to the cling point.

23. The method of claim 22, further comprising the step of:

continually re-orienting and re-positioning the selected graphic object relative to a sliding cling point which moves relative to the graphic cursor as it is moved within the predetermined proximity.

24. A presumptive mode computer aided design system for interactively manipulating and displaying a selected object according to predefined geometric relationships, comprising:

a display device for displaying a graphic environment;

memory for storing data, including:

a data base defining geometric relationships among graphic objects;

a plurality of graphic object files, each defining a corresponding graphic object and associated symbol for display in said graphic environment; and

a design file for incorporating a plurality of underlying graphic objects according to said geometric relationships;

a pointing device for receiving input from an operator; and

a processor coupled to said memory, said display device and said pointing device for controlling said graphic environment;

wherein the operator selects an object for insertion into said design file and manipulates a graphic cursor in proximity with one of said underlying graphic objects displayed in said geographic environment, wherein said processor moves said selected object with said graphic cursor and then manipulates said graphic object and said design file in to a geometric relationship when said selected object is within proximity with said one of said underlying graphic objects, and wherein said processor dynamically updates said geometric relationship based on movement of said graphic cursor while said graphic cursor is within proximity of said underlying graphic objects.

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